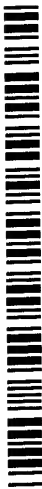


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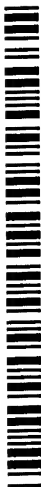
371 Application As-Filed

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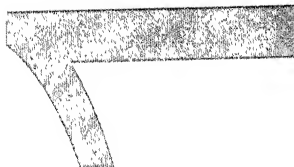


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Transmittal



Level - 2
Version 1.1
Updated - 8/01/01

Express Mail Label No. EUL47832667US
FORM PTO-1590
(REV. 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER
5183/US/PC/T/BG
U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

10/070330

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

INTERNATIONAL APPLICATION NO. 30 June 2001 (30.06.01)

PCT/US01/41237

TITLE OF INVENTION AUTOMATIC DOOR OPENER

PRIORITY DATE CLAIMED
07 July 2000 (7.07.00)

APPLICANT(S) FOR DO/EO/US William Tyler Weaver

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(d)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

Return Postcards
Recordation Form Cover Sheet (Form PTO-1595)

U.S. APPLICATION NO. 10,070,330 INTERNATIONAL APPLICATION NO. PCT/US01/41237	ATTORNEY'S DOCKET NUMBER 5183/US/PTC/BG	CALCULATIONS PTO USE ONLY
21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO 890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(d)-(4) \$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(d)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT = 20 30		
Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(e)).		
CLAIMS	NUMBER FILED 16 -20 = 0 3 -3 = 0	NUMBER EXTRA 0 0
Total claims		RATE x \$18.00
Independent claims		x \$80.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)		+ \$270.00
TOTAL OF ABOVE CALCULATIONS =		\$ 890.00
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.		\$ 0.00
Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492(f)).		SUBTOTAL = 20 30 \$ 890.00
TOTAL NATIONAL FEE =		\$ 890.00
Fee for recording the enclosed assignment (37 CFR 1.21(b)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +		\$ 40.00
TOTAL FEES ENCLOSED =		\$ 930.00
Amount to be refunded:		\$
charged:		\$

a. ☒ A check in the amount of \$ **930.00** to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.

c. ☐ A duplicate copy of this sheet is enclosed.

d. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **04-1696**. A duplicate copy of this sheet is enclosed.

e. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Valerie G. Dugan
 Dugan & Dugan, LLP
 18 John Street
 Tarrytown, NY 10591
 United States of America

SIGNATURE Valerie G. Dugan 3/5/02

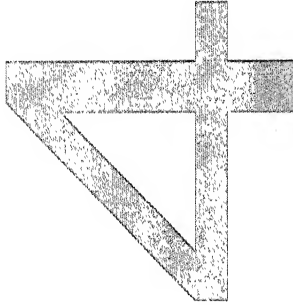
NAME Valerie G. Dugan

REGISTRATION NUMBER 36,125

UNITED STATES PATENT AND TRADEMARK OFFICE
DOCUMENT CLASSIFICATION BARCODE SHEET



Specification



Level - 2
Version 1.1
Updated - 8/01/01

AUTOMATIC DOOR OPENER

104070330

This application claims priority from U.S.

5 Provisional Patent Application Serial No. 60/217,147, filed
July 7, 2000, which is hereby incorporated by reference
herein in its entirety.

FIELD OF THE INVENTION

10 The invention relates generally to fabrication
systems and more particularly to an apparatus and method for
opening a door portion of a wafer carrier.

BACKGROUND OF THE INVENTION

15 Conventional semiconductor fabrication systems
transport a plurality of wafers in a sealed wafer carrier
such as a sealed container or pod, thereby maintaining the
wafers in a clean/controlled environment. Thus,
conventional processing systems include a plurality of wafer
20 carrier loading stations where the sealed pods are opened,
wafers are extracted therefrom and are loaded into the
processing system. Each wafer carrier loading station
comprises a wafer carrier platform adapted to receive a
sealed pod, which contains a cassette of wafers, and a wafer
25 carrier opener adapted to engage and unlatch a door portion
of the pod (hereinafter a pod door).

In operation, the wafer carrier platform receives
a pod and moves the pod horizontally toward the wafer
30 carrier opener. Thereafter, the wafer carrier opener
engages and unlatches the pod door. A first actuator moves
the pod door horizontally away from the wafer carrier
platform, and then a second actuator moves the pod door
vertically downward to provide clear access to the wafers in
the pod. Hence, the wafer carrier opener requires the use

of two separate actuators, which increases equipment expense.

Accordingly, there is a need for an improved wafer carrier opener having a pod door that moves both vertically and horizontally while using only a single actuator, thus satisfying the ever-present demand for reduced cost per unit wafer processed.

SUMMARY OF THE INVENTION

The inventive wafer carrier opener may eliminate the use of two separate actuators by using a linkage mechanism. The inventive wafer carrier opener comprises a wafer carrier door receiver, adapted to receive a wafer carrier door, a horizontally stationary member, and a link coupled between the wafer carrier door receiver and the horizontally stationary member so as to allow horizontal movement of the wafer carrier door receiver.

A method of opening a sealed wafer carrier, the method comprising: elevating a wafer carrier door receiver assembly; impacting a vertical motion stop with a portion of the wafer carrier door receiver assembly thereby limiting the vertical motion of a portion of the wafer carrier door receiver assembly; continuing elevating a remaining portion of the wafer carrier door receiver assembly; and translating the continued elevation of the remaining portion of the wafer carrier door receiver assembly into horizontal motion of at least a door receiving portion of the vertically limited portion of the wafer carrier door receiver assembly.

Other features and advantages of the present invention will become more fully apparent from the following detailed description of the preferred embodiments, the appended claims and the accompanying drawings.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 is a schematic top plan view, in pertinent part, of a processing system having a factory interface wafer handler adapted to transport wafers between a plurality of wafer carrier loading stations and a processing tool;

FIG. 2A is a schematic side view of the wafer carrier loading station of FIG. 1, having the conventional wafer carrier opener;

FIG. 2B is a side cross-sectional view of the conventional wafer carrier opener of FIG. 2A;

FIGS. 3A-D are sequential side views of a first embodiment of an inventive wafer carrier opener;

FIG. 4 is a perspective side view of the inventive wafer carrier opener of FIGS. 3A-D;

FIGS. 5A-C are side views of a second embodiment of the inventive wafer carrier opener; and

FIG. 6 is a perspective side view of the second embodiment of the inventive wafer carrier opener with a horizontally stationary member in an alternative position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 is a schematic top plan view, in pertinent part, of a processing system 11 having a factory interface wafer handler 13 adapted to transport wafers between a plurality of wafer carrier loading stations 15a-d and a processing tool 17. The exemplary processing system 11 shown in FIG. 1 includes an interface chamber 19 and the processing tool 17 which, in this example, comprises a pair of loadlock chambers 23, a transfer chamber 25 coupled to the loadlock chambers 23, and a plurality of processing chambers 27 coupled to the transfer chamber 25.

processing chamber 27 wherein a processing step is performed on the wafer.

FIG. 2A is a schematic side view of the wafer carrier loading station 15 of FIG. 1, having the conventional wafer carrier opener 37. As previously stated, the wafer carrier loading station 15 comprises a wafer carrier platform 41 adapted to receive a pod 43 and the conventional wafer carrier opener 37 adapted to engage and unlatched a pod door 45 as is known in the art.

FIG. 2B is a side cross-sectional view of the conventional wafer carrier opener 37 of FIG. 2A. The conventional wafer carrier opener 37 defines a recess 47 into which a pod door 45 (shown in FIG. 2A) is received. The recess 47 is defined by a plate 49 and a wall 51. The plate 49 of the recess 47 includes a pod door key actuating mechanism 53, which is connected to a key 55 and to an actuator 57 adapted to unlatch the pod door 45 from the remainder of the pod 43. Alignment pins 59 are also provided on the plate 49 for aligning the pod door 45 with the conventional wafer carrier opener 37 such that the pod door receiver key 55 enters a corresponding key hole (not shown) on the pod door 45.

In operation, the wafer carrier platform 41 moves in a horizontal plane to receive the pod 43 in a position away from the interface wall 29. The wafer carrier platform 41 then moves the pod 43 into a position adjacent the interface wall 29. In this position the pod door 45 is positioned within the recess 47 of the conventional wafer carrier opener 37.

The alignment pins 59 on the conventional wafer carrier opener 37 ensure proper alignment of the pod door 45 such that the key 55 positioned on the conventional wafer carrier opener 37 engages the pod door lock (not shown).

The actuator 57 then activates the pod door key actuating mechanism 53, which in turn rotates the key 55 to unlatch the pod door latches (not shown). Once the pod door latches are unlatched, the pod door 45 is unlocked from the remainder of the pod 43.

Thereafter, the conventional wafer carrier opener 37 having the pod door 45 now attached thereto moves the pod door 45 horizontally, via a horizontal actuator (e.g., a first actuator not shown), in a direction away from the wafer carrier platform 41, as indicated by arrow A. A vertical actuator (e.g. a second actuator not shown) then moves the pod door 45 vertically downward, as indicated by arrow B, until the pod door 45 clears the opening in the interface wall 29 to provide access to the wafers or cassette in the pod 43 by a wafer handler 13 within the interface chamber 19. As described above, the conventional wafer carrier opener 37 requires the use of two separate actuators in order to open and/or close a sealed wafer carrier.

Accordingly, the present inventor has provided an improved wafer carrier opener that employs a single actuator to achieve both the vertical and horizontal pod door movement.

The components of a first embodiment of an inventive wafer carrier opener 101a are described with reference to FIGS. 3A-4. FIGS. 3A-D are sequential side views of the inventive wafer carrier opener 101a, and FIG. 4 is a perspective side view of the inventive wafer carrier opener 101a. Except for the two actuators (a horizontal actuator, and a vertical actuator) the inventive wafer carrier opener 101a may comprise the same components as the conventional wafer carrier opener 37 of FIG. 2B. The conventional components of the inventive wafer carrier

opener 101a are therefore not further described with reference to FIGS. 3A-4. In addition to the conventional components, the inventive wafer carrier opener 101a of FIGS. 3A-4 comprises a horizontally stationary member 107 (e.g., a member fixed against horizontal motion via a track which allows vertical motion of the horizontally stationary member 107 but which prohibits horizontal motion), and a link 109 coupled between a wafer carrier door receiver 103 and the horizontally stationary member 107, so as to allow vertical actuation to be translated into horizontal movement of the wafer carrier door receiver 103, as described below.

The link 109 may comprise an upper link 111 and a lower link 113, both adapted to pivot between a retracted position and an extended position. The upper link 111 comprises a first joint 115 and a second joint 117. The first joint 115 is coupled to the horizontally stationary member 107 and the second joint 117 is coupled to the wafer carrier door receiver 103. Similarly, the lower link 113 comprises a first joint 119 and a second joint 121, which also are coupled to the horizontally stationary member 107 and the wafer carrier door receiver 103, respectively. Thus, the wafer carrier door receiver 103, the horizontally stationary member 107, the upper link 111, and the lower link 113 may be configured to comprise what is conventionally known as a four-bar link.

The inventive wafer carrier opener 101a further comprises a mechanism (e.g., a cam follower 123) that may be coupled to the horizontally stationary member 107 so as to move vertically therewith, and such that the horizontally stationary member 107 also may move vertically relative to the cam follower 123. In one aspect, the cam follower 123 may be positioned in a slot 125 (FIG. 4) of the horizontally

stationary member 107 as shown in FIG. 4. Also as shown in FIG. 4, an additional link 109 may be included if desired.

The cam follower 123 comprises a vertical extension 127 and a horizontal extension 129. The vertical extension 127 of the cam follower 123 is coupled to the wafer carrier door receiver 103, (in this example via the second joint 121 of the lower link 113), so that the cam follower 123 moves horizontally with the wafer carrier door receiver 103. The horizontal extension 129 is adapted so as to contact a vertical motion stop (e.g., a cam 131) as the inventive wafer carrier opener 101a moves vertically upward, thereby stopping further vertical motion of the cam follower 123.

The cam 131 is positioned adjacent the cam follower 123 and between the horizontal extension 129 and the wafer carrier door receiver 103 as shown in FIGS. 3A-C. Specifically, the cam 131 is positioned such that when the horizontal extension 129 of the cam follower 123 contacts the cam 131, the wafer carrier door receiver 103 is in position to engage (e.g., at the same elevation as) the pod door 45, located on the wafer carrier platform 41. Hence, the cam 131 and the wafer carrier platform 41 may serve as datum points to provide accurate alignment of the inventive wafer carrier opener 101a so as to properly position the wafer carrier door receiver 103 relative to the pod door 45.

The inventive wafer carrier opener 101a may also include a counterbalancing mechanism adapted to bias the wafer carrier door receiver 103 upwardly. The counterbalancing mechanism may be coupled to the horizontally stationary member 107 and to the wafer carrier door receiver 103. For example, the counterbalancing mechanism may comprise an extension 135 of the horizontally stationary member 107 that extends above the elevation of

the wafer carrier door receiver 103, and a biasing mechanism 137 coupled between the extension 135 and the wafer carrier door receiver 103 as shown in FIGS. 3A-C. The biasing mechanism 137 may comprise a spring, a cylinder, a counterweight, or any mechanism that may bias the wafer carrier door receiver 103 upwardly so as to resist the gravitational force that otherwise may move the wafer carrier door receiver 103 vertically downward.

A vertical actuator such 139 is adapted to vertically move the inventive wafer carrier opener 101a upwardly, so as to place the wafer carrier door receiver 103 in position to engage the pod door 45. The actuator 139 also is adapted to vertically move the inventive wafer carrier opener 101a downward so as to expose an opening 35 (FIG. 1) in the interface wall 29, thereby allowing access to the wafers in the pod 43.

The operation of the inventive wafer carrier opener 101a is described with reference to the sequential views of FIGS. 3A-D, which show the movement of the inventive wafer carrier opener 101a. The upper link 111 and the lower link 113 are initially in a retracted (e.g. horizontal) position as shown in FIG. 3A.

In operation, the actuator 139, which is coupled to the horizontally stationary member 107, is energized and moves the horizontally stationary member 107 vertically upward, carrying the cam follower 123, and the wafer carrier door receiver 103 therewith. As the inventive wafer carrier opener 101a moves vertically upward, the horizontal extension 129 of the cam follower 123 contacts the cam 131 so as to prevent the cam follower 123 from further upward movement. The wafer carrier door receiver 103 also is prevented from moving vertically upward because the vertical extension 127 of the cam follower 123 is coupled to the

receiver 103 upwardly (thus resisting the gravitational force that otherwise may move the wafer carrier door receiver 103 vertically downward and pulling the upper and lower links 111, 113 into the retracted position).

At the interface wall 29, the wafer carrier door receiver 103 of the inventive wafer carrier opener 101a couples to and unlatches the pod door 45, as is conventionally known. Once the door 45 is opened, the actuator 139 reverses direction, and the horizontally stationary member 107 and the extension 133 (having the door attached thereto via the wafer carrier door receiver 103) begin moving vertically downward. As the horizontally stationary member 107 moves vertically downward, the first joints 115, 119 of the upper link 111 and the lower link 113 move downward. Because the position of first joints 115, 119 is horizontally fixed with respect to the wall 29 of the interface chamber 19, vertical motion of the joints 115, 119 enables the bar 129 to move to a position below the cam 131 in which the bar 129 no longer contacts the cam 131, thereby enabling biasing member 137 to retract and move the inner links 117, 121 upward and away from the pod 43 to retract the door 45 therefrom. Specifically, in this example, the biasing mechanism 137 is sufficiently stiff so as to continually upwardly bias the wafer carrier door receiver 103 (with or without the added weight of the door 45). Thus, when the bar 129 no longer contacts the cam 131 (which contact prevents the wafer carrier door receiver 103 from moving upward in response to the upward bias applied by the biasing mechanism 137), the biasing mechanism 137 causes the wafer carrier door receiver 103 to retract away from the pod 43, as described above.

As the upper link 111 and lower link 113 move to the retracted position, the cam follower 123 and the wafer

As the upper link 111 and the lower link 113 move to the retracted position, the cam follower 123 and the wafer carrier door receiver 103 coupled thereto move horizontally in a straight line (e.g., due to the horizontally straight configuration of the horizontal extension 129 and the vertical fixation thereof when engaged with the cam 131) toward the interface wall 29 (FIG. 2) as shown in FIG. 5B. As the wafer carrier door receiver 103 moves horizontally toward the interface wall 29, and as the counterbalancing mechanism moves vertically upward, the biasing mechanism 137 of the counterbalancing mechanism also biases the wafer carrier door receiver 103 upwardly (thus resisting the gravitational force that otherwise may move the wafer carrier door receiver 103 vertically downward and pulling the upper and lower links 111, 113 into the retracted position).

At the interface wall 29, the wafer carrier door receiver 103 of the inventive wafer carrier opener 101b couples to and unlatches the pod door 45, as is conventionally known. Once the pod door 45 is opened, the inventive wafer carrier opener 101b (having the pod door 45 attached thereto via the wafer carrier door receiver 103) moves vertically downward so as to provide an opening in the interface wall 29, thereby allowing access to the wafers in the pod 43 as shown in FIG. 5C.

As is evident from the description above, the inventive wafer carrier opener 101a, 101b may use a single actuator 139, which may result in increased equipment reliability, and reduced cost per unit wafer processed.

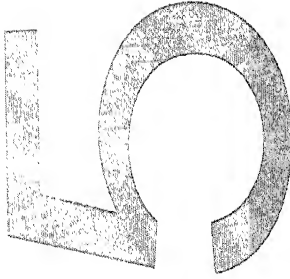
Further, the cam 131 provides a convenient datum point that allows the position of the wafer carrier door receiver 103 to be accurately controlled relative to the pod door 45. Additionally, the preferred straight-line motion

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Claims



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6. The wafer carrier opener of claim 5 wherein the link comprises a pair of links coupled between the wafer carrier door receiver and the horizontally stationary member such that the wafer carrier door receiver, the horizontally stationary member, and the pair of links form a four-bar link.

7. The wafer carrier opener of claim 1 further comprising a counterbalance coupled to the horizontally stationary member and to the wafer carrier door receiver, the counterbalance adapted to bias the wafer carrier door receiver upwardly.

8. The wafer carrier opener of claim 7 further comprising a vertical motion stop and a mechanism coupled to the horizontally stationary member so as to move vertically therewith, and coupled to the wafer carrier door receiver so as to move horizontally therewith, the mechanism adapted so as to contact the vertical motion stop and to thereby be stopped from further vertical motion.

9. The wafer carrier opener of claim 8 wherein the counterbalance comprises a spring.

10. A wafer carrier opener comprising:
a wafer carrier door receiver adapted to receive a wafer carrier door;
a horizontally stationary member;
a cam follower, coupled to the horizontally stationary member so as to allow relative movement there between and fixedly coupled to the wafer carrier door receiver;

portion of the vertically limited portion of the wafer carrier door receiver assembly.

5 12. The method of claim 11 wherein impacting a vertical motion stop with a portion of the wafer carrier door receiver assembly thereby limiting the vertical motion of a portion of the wafer carrier door receiver assembly comprises:

10 placing a vertical motion stop adjacent the wafer carrier door receiver assembly wherein the wafer carrier door receiver assembly comprises a door receiving portion, a horizontally stationary member, a cam follower coupled to the door receiving portion and to the horizontally stationary member; and

15 impacting a vertical motion stop with the cam follower thereby limiting the vertical motion of the door receiving portion and the cam follower.

20 13. The method of claim 11 wherein translating the continued elevation of the remaining portion of the wafer carrier door receiver assembly into horizontal motion of at least a door receiving portion of the vertically limited portion of the wafer carrier door receiver assembly comprises:

25 linking at least a door receiving portion of the vertically limited portion of the wafer carrier door receiver assembly with the remaining portion of the wafer carrier door receiver assembly that continues to be elevated.

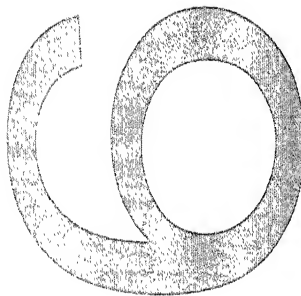
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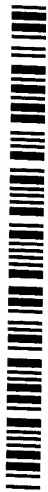


Abstract

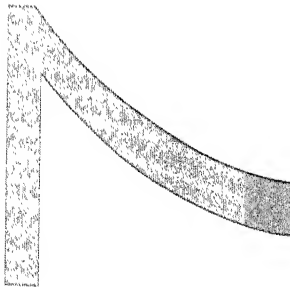


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Drawings



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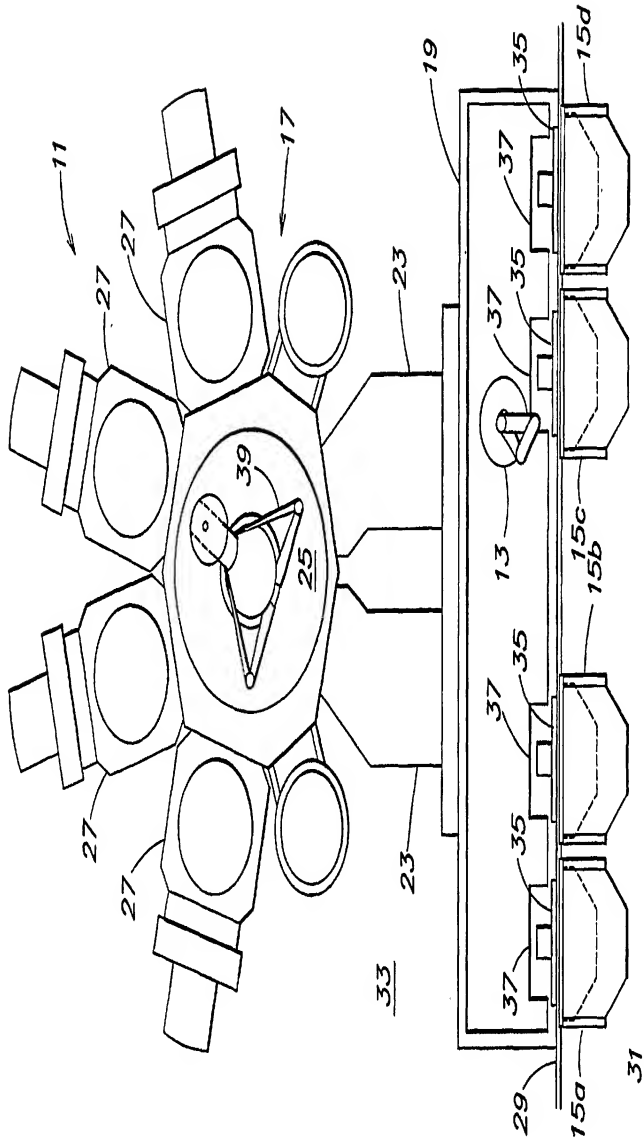


FIG. 1
(PRIOR ART)

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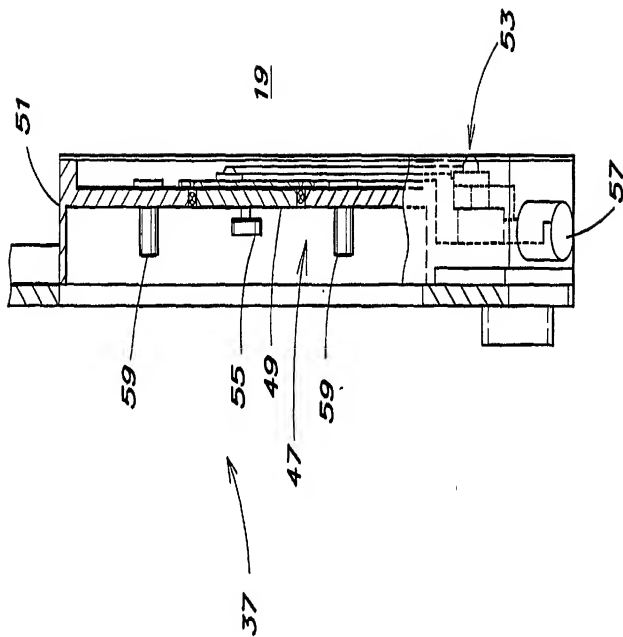


FIG. 2B
(PRIOR ART)

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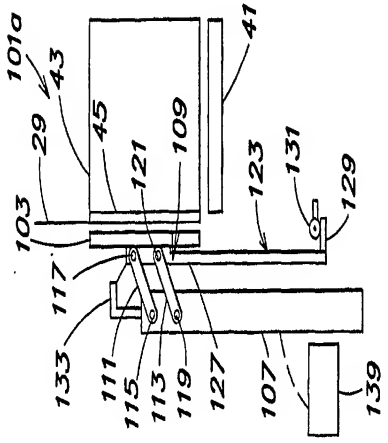


FIG. 3A

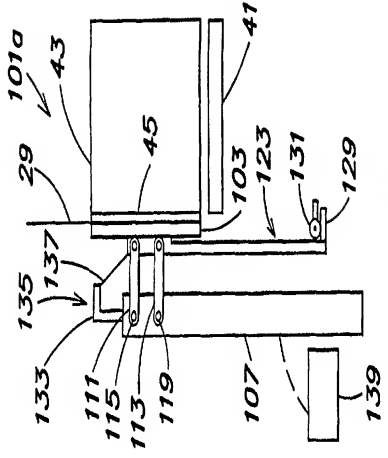


FIG. 3B

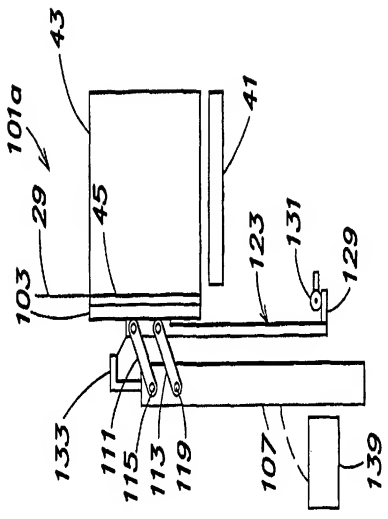


FIG. 3C

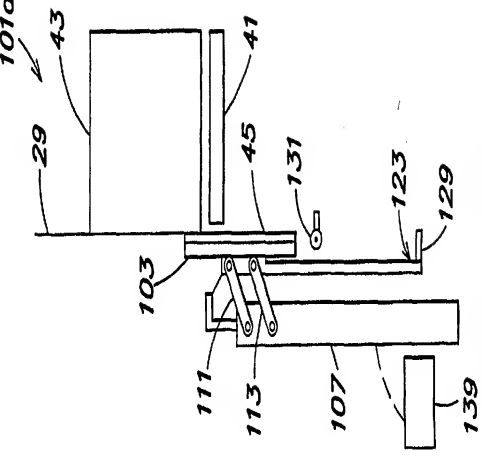


FIG. 3D

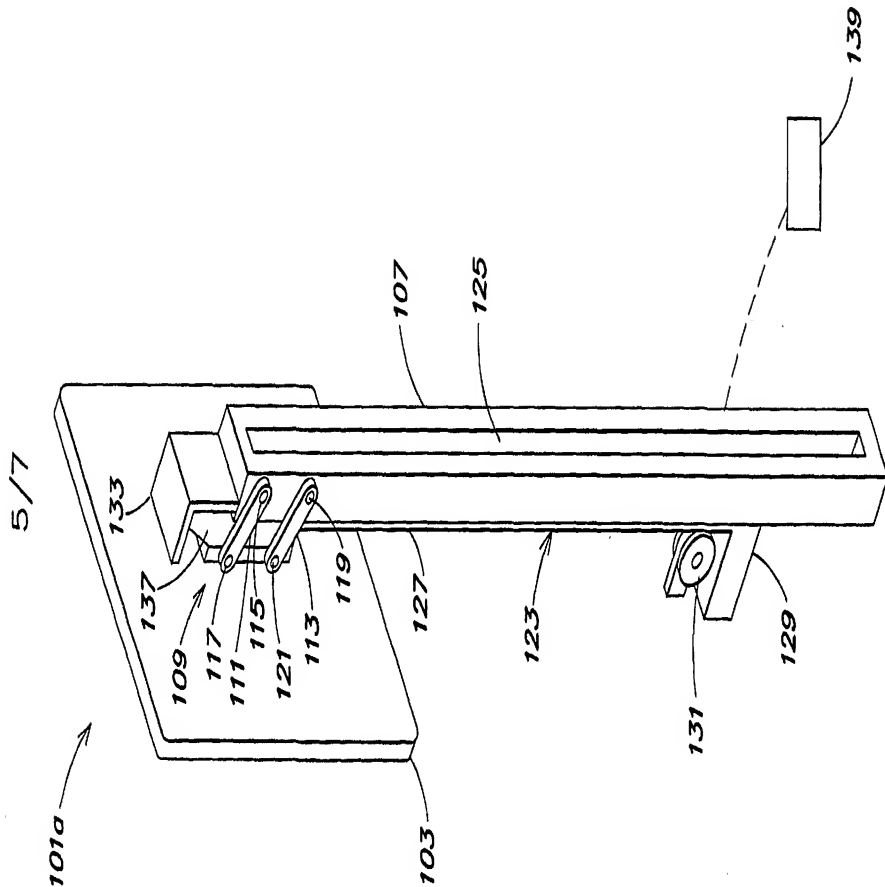


FIG. 4

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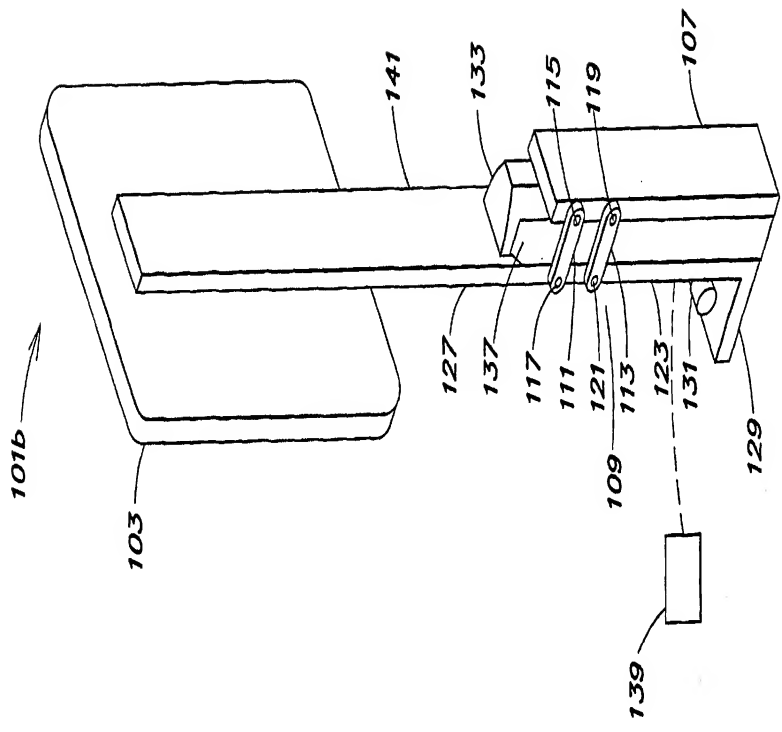


FIG. 6

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Express Mail Label No.: EU147832667US

Case No.: 5183/PCT/BG

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

This declaration is of the following type:

- ☒ original
- ☐ divisional
- ☐ continuation
- ☐ continuation-in-part

INVENTORSHIP IDENTIFICATION

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

AUTOMATIC DOOR OPENER

SPECIFICATION IDENTIFICATION

The specification of which:

- ☐ is attached hereto
- ☐ was filed _____, under Serial No. _____, executed on even date herewith; or
- ☐ Express Mail No. _____ (as Serial No. not yet known) and was amended on _____ (if applicable)
- ☒ was described and claimed in PCT International Application No. PCT/US01/41237 filed on June 30, 2001.

ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulations, 1.56,

and which is material to the examination of this application; namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

- ☐ In compliance with this duty there is attached an Information Disclosure Statement in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. §119)

I hereby claim foreign priority benefits under Title 35, United States Code, §119, of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than

the United States of America or of any United States Provisional Application(s) listed below, and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

☐ No such applications have been filed.

☒ Such applications have been filed as follows:

- A. Prior foreign/PCT/provisional application(s) filed within 12 mos. (6 mos. for design) prior to this application, and any priority claims under 35 U.S.C. § 119

Country/PCT
US

Application No
60/217,147

Date Filed
July 7, 2006

Priority Claimed
☒ Yes ☐ No
☐ Yes ☐ No

- B. All foreign application(s), if any, filed more than 12 mos. (6 mos for design) prior to this U.S. application

Country:

Application No:

Filing date:

PRIORITY CLAIM (35 U.S.C. §120)

I hereby claim the benefit under Title 35, United States Code, § 120, of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below, and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s), in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information that is material to the examination of this application (namely, information where there is substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

☒ No such applications have been filed

☐ Such applications have been filed, as follows:

Serial No.	Filing Date	Patent Pending	Status	Abandoned
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POWER OF ATTORNEY

I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and, further, that these statements were made with the knowledge that willful false statements, under the like so made are punishable by fine or imprisonment, or both under Sec. 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

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(Declaration ends with this page)